# APPENDIX L

# Rural Roadway Design Concepts

Parametrix ENGINEERING . PLANNING . ENVIRONMENTAL SCIENCES

# TECHNICAL MEMORANDUM

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| Date: | October 8, 2007 |
| To: | Jesse Hamashima |
| From: | Dan McReynolds |
| Subject: | Rhodes Lake Road Rural Roadway Design Concepts |
| cc: | |
| Project Number: | 214-1631-036 |
| Project Name: | Rhodes Lake Road Corridor Study Final EIS |

## BACKGROUND

The June 2007 Rhodes Lake Road Corridor Study Draft Programmatic EIS represented the culmination of years of research, analysis and public involvement to examine solutions to accommodate travel to and from the Orting Plateau. Through the life of the project, dozens of unique alignments were evaluated against criteria categories of traffic and mobility, built environment impacts and natural environment impacts. Following this in-depth analysis, three build alternatives in addition to the Baseline (or No Build) Alternative were advanced for evaluation in the Draft EIS. Of these alternatives, Alternative D was recommended as the preferred alternative, because the Rhodes Lake Road Study Team and Project Leadership Team believe it provides the best balance between maximized mobility and minimized impacts to the surrounding area including the community and built and natural environments**.**

Public comments received on the Draft EIS included concerns related to preserving the rural nature of the Puyallup Valley. The rural character of the valley has been a major consideration throughout the screening and development of the Rhodes Lake Road Corridor alternatives. As detailed in Chapter 2 of the Draft EIS, the early stages of alternatives development examined several alignments that traversed the least-developed areas of the valley, which would be typical locations for siting a new corridor. Although right-of-way acquisition cost and residential impacts would be lower on less-developed properties, these alignments were later rejected in favor of alignments that would result in fewer impacts to the rural character of the area. The County's commitment to preserving rural areas factored into recommending Alternative D as the preferred alternative. Alternative D would widen the existing 128$^{th}$ Street corridor across the valley rather than create an entirely new roadway. This feature of Alternative D identified it as the least objectionable among the build alternatives that would truly accommodate the travel needs of the larger community.

The County is committed to designing a corridor that minimizes effects to the surrounding rural community. The purpose of this memo is to discuss possible strategies that could minimize the effect of a major roadway corridor in this area.

## RURAL ROADWAY SECTIONS

*Exhibits 1 – 4*, attached, illustrate options for a roadway section that aims to minimize effects of the roadway to the surrounding community.

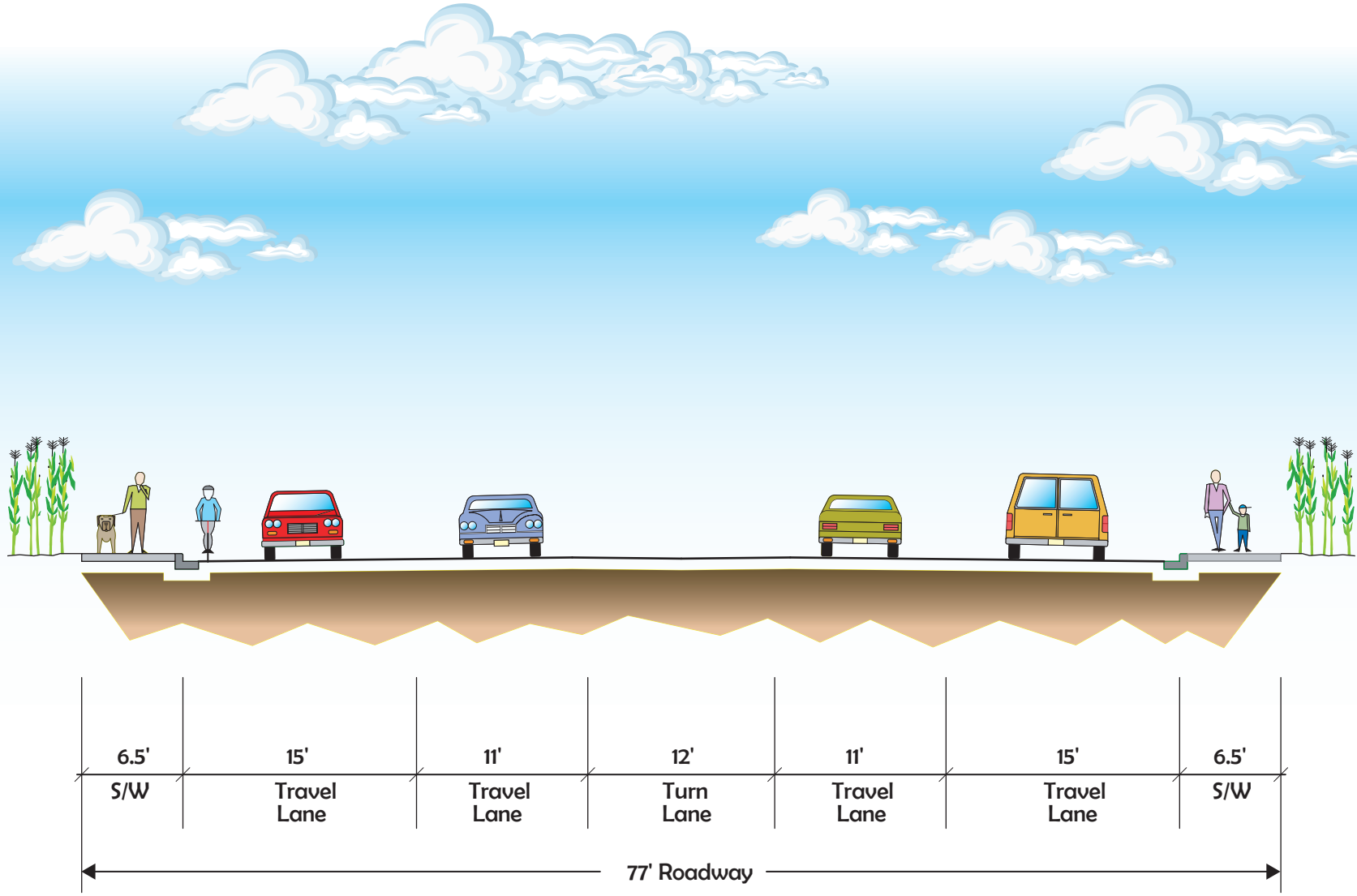
*Exhibit 1* depicts a 5-lane urban roadway consisting of two lanes of travel in each direction and a 12-foot wide center turn lane. Inside travel lanes are 11 feet wide and outside lanes are 15 feet wide to accommodate shared use with bicycles. This section includes curb and gutter and 6.5-foot wide sidewalks on either side of the roadway. Total width of this roadway section is 77 feet.

*Exhibit 2* illustrates a 5-lane rural roadway section. Similar to the urban section, this rural roadway would include two lanes of travel in each direction flanking a 12-foot wide center turn lane; however, for this section all four east-west travel lanes are 11 feet wide. This section includes 7-foot wide paved shoulders on both sides of the roadway, with 8 feet of open drainage outside the shoulder on one side of the road. Outside the drainage area, a 12-foot asphalt trail with 2-foot gravel shoulders on each side would serve alternative modes of travel. Roadway width is 70 feet; with separated trail total width of this section is 94 feet.

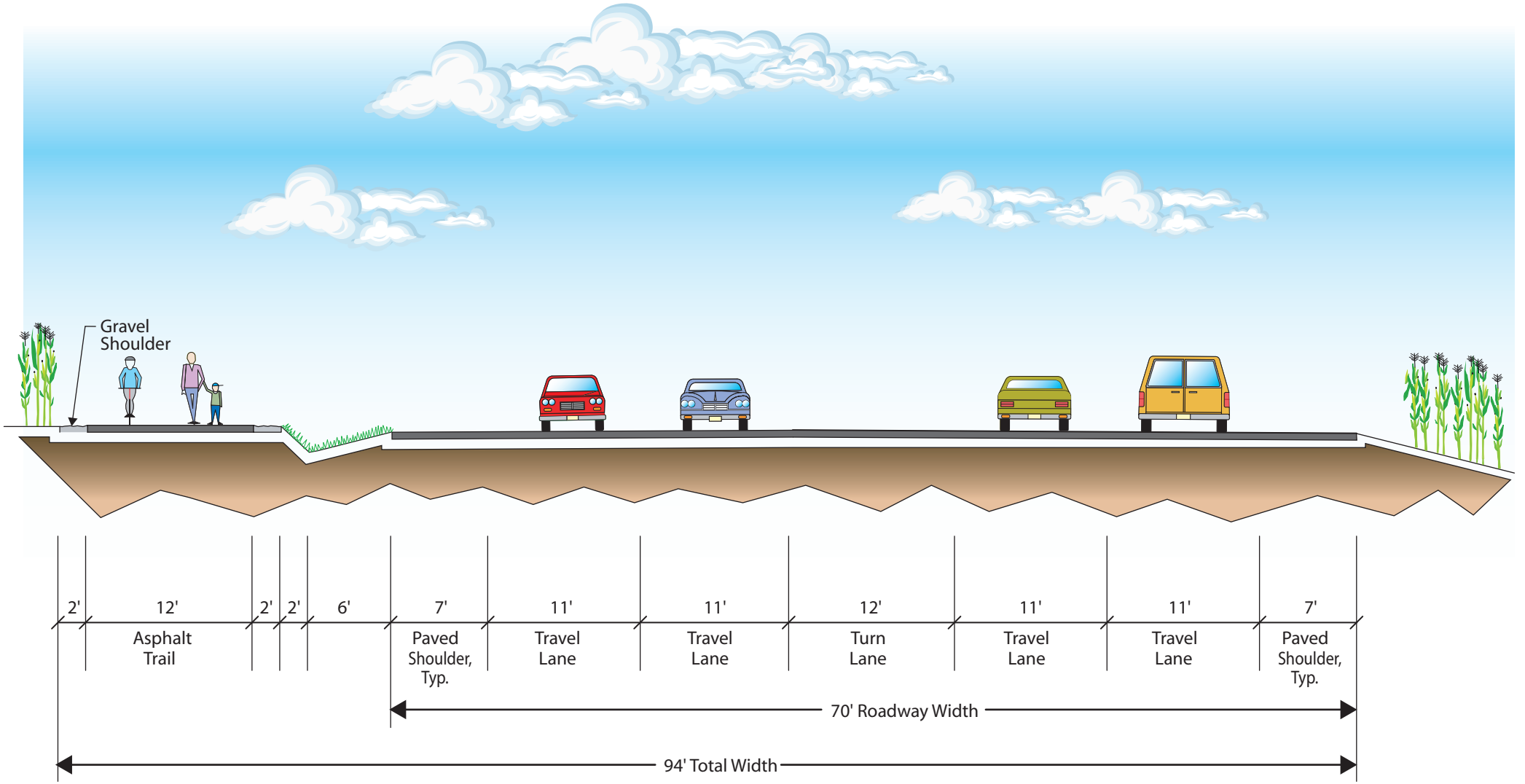
*Exhibit 3* shows a 4-lane rural roadway section consisting of two lanes, one 12-foot and one 11-foot, in each direction and 7-foot paved shoulders on each side of the road. This section contains a raised center median to prevent left turns. With the high volumes on 128$^{th}$ Street, cars turning left from a through lane would be essentially stopping in the middle of a travel lane, which would create a hazard. This option would sacrifice the ability to turn left in order to minimize the road width. As with the 5-lane rural section, this concept includes an 8-foot wide open drainage system and a 12-foot multi-use asphalt path. Roadway width in this scenario is 61 feet; total width including trail is 85 feet.

*Exhibit 4* illustrates a 4-lane rural roadway section consisting of two 11-foot travel lanes in each direction, separated by a 12-foot wide "ecology ditch" with 2-foot wide gravel edges on either side. An ecology ditch is a swale that handles runoff from the pavement, and also provides quality treatment to that runoff. The ecology ditch would prohibit left-turning movements to preserve safety and mobility. Inside travel lanes have a 2-foot paved shoulder and outside travel lanes have a 7-foot paved shoulder. A 12-foot asphalt multi-use trail is separated from the outside shoulder by a 4-foot vegetated strip, and has a 2-foot gravel shoulder on the far side. Roadway width is 78 feet; width including the trail would total 96 feet.

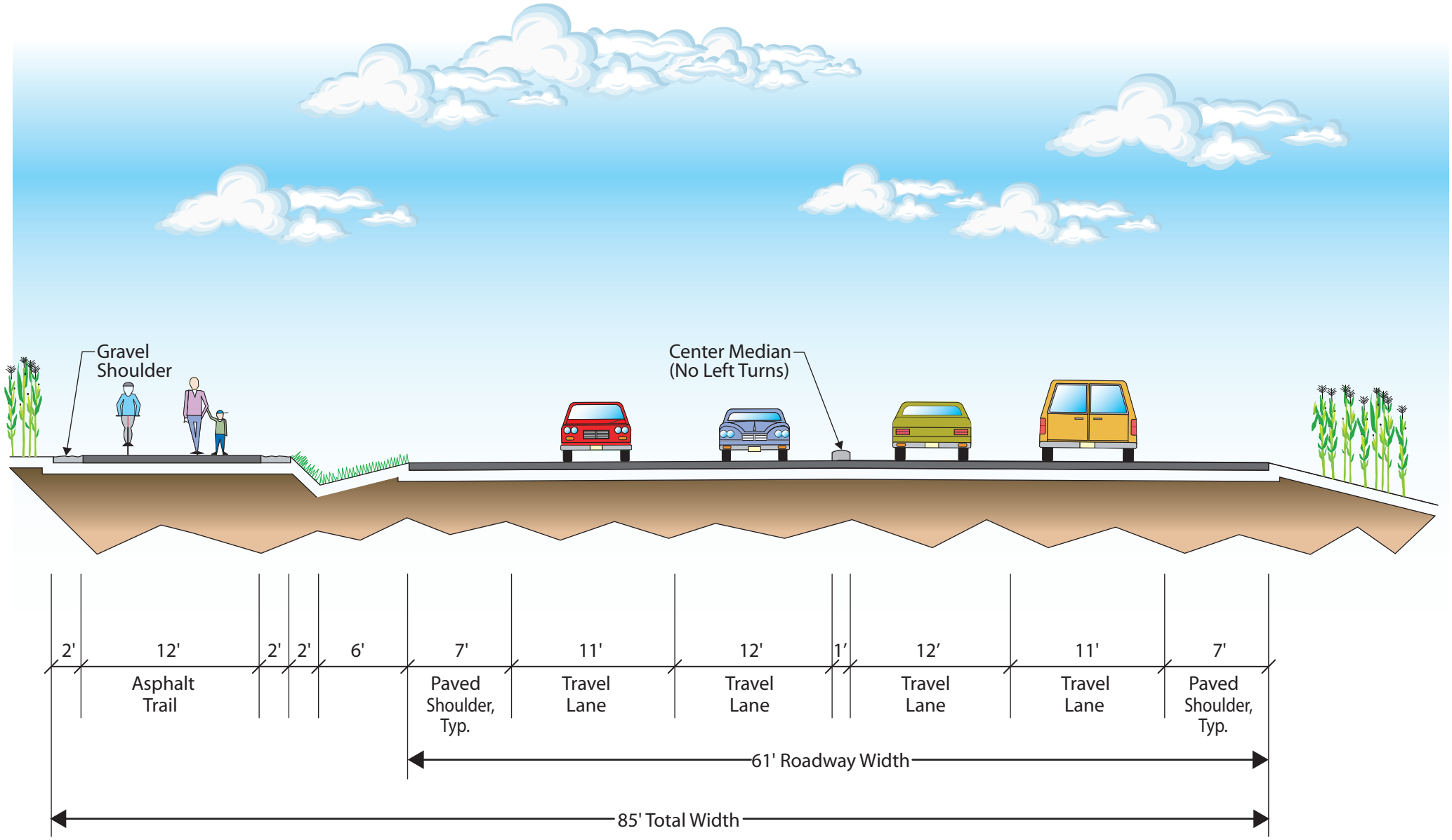
As illustrated, the appearance of the roadway sections in Figures 2, 3 and 4 could project a rural character by creating a separated multi-use trail in place of sidewalks, and incorporating vegetation with a center ecology ditch or an open drainage system beside the roadway rather than curb and gutter as is generally associated with a more urban aesthetic. However, while a rural appearance may better blend into the surroundings, a trade-off associated with the rural roadway sections involves additional right-of-way requirements. Total width of the urban roadway section would be 77 feet, while the rural sections require 94, 85, and 96 feet respectively, and would therefore result in greater property impacts to adjacent parcels, including farmlands. It is important to note, that the property takes discussed in the Draft EIS, assumed a typical right-of- way width of 100 feet. It may be difficult to construct roadway, shoulders, and earthwork for the wider sections discussed above within 100 feet. Therefore, if a larger roadway section were selected, property impacts could be greater than those reported in the Draft EIS.




# Exhibit 1
# 5-Lane Urban Section




# Exhibit 2
# 5-Lane Rural Section
## (Open Drainage)




# Exhibit 3
# 4-Lane Rural Section
## (Open Drainage)

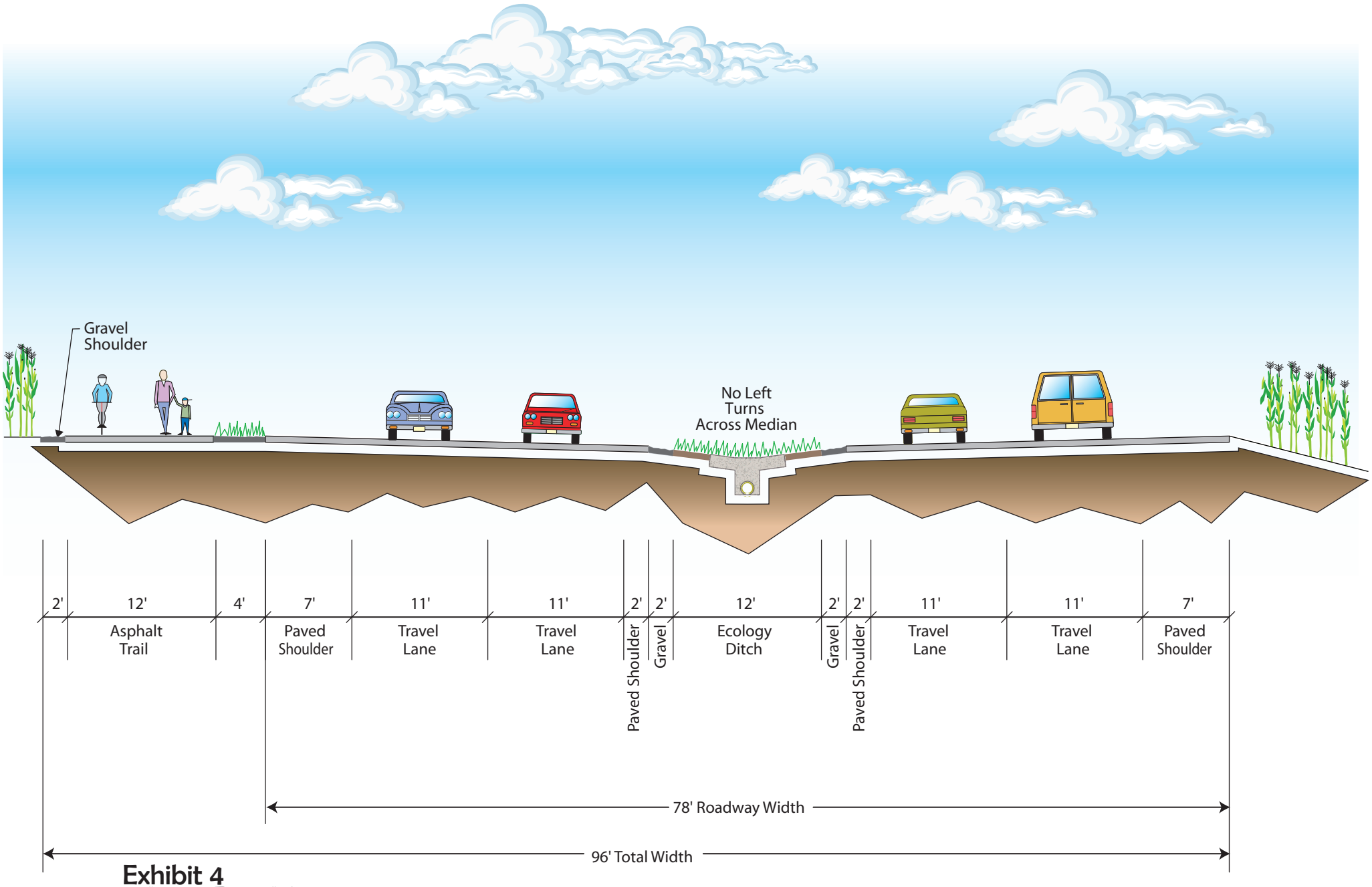



**Exhibit 4**
**4-Lane Rural Section**
**(Ecology Ditch)**

## ACCESS MANAGEMENT CONSIDERATIONS

One way to minimize effects of a new roadway to the surrounding rural community is to strictly manage and control access to and from the roadway. Effective access management and control can minimize effects to the surrounding community by lessening the desirability of the land for redevelopment. The Washington State Department of Transportation (WSDOT) often manages access on state highways to maximize roadway capacity and minimize property impacts as discussed below.

### "Access Control" vs "Managed Access"

There are two primary ways that WSDOT handles access to state highways; access control and managed access. The purpose of WSDOT's efforts to control access and manage access is to decrease likelihood of safety hazards and traffic congestion that may result from many access points located in too close proximity, which reduces level of service on the roadway. These measures manage traffic movements onto and off the roadway to minimize conflict and increase traffic flow, maintaining safer conditions for drivers and providing needed capacity. The process for establishing access control in a corridor is very specific and is outlined in detail in Chapter 14 of the WSDOT Design Manual. A justification for limited access must be established through coordination with local agencies, documented in an Access Report, and the public, via an Access Hearing. After the hearing, the public has an opportunity to comment and/or legally challenge. Then WSDOT has the right to establish limited access on purchased right-of-way. Full, partial, or modified access rights must be purchased from each property in addition to purchasing associated real property. Once the process is completed, WSDOT ownership of a property owner's right of access to the highway is documented on the parcel's title report. Until this documentation has taken place, access control is not established or enforceable by WSDOT.

With managed access, WSDOT does not own any particular property right but instead uses the authority granted in the Washington Administrative Code (WAC)/Revised Code of Washington (RCW), "*Managed access regulation is based upon the premise that the access rights of a property owner are subordinate to the public's right and interest in a safe and efficient highway system. An abutting property owner has a right to reasonable access to a state highway, but may not have the right of a particular means of access*." [RCW 47.50.010(3)]

Because managed access is ultimately not as effective as access control, particularly when dealing with "grandfathered" conditions; managed access works best if new or redevelopment is occurring and the local agency is supportive of the WSDOT policy. For example, in the case of a completely new corridor, full access control would more likely be implemented as the access rights are purchased as the properties are acquired. In the case where improvements are made to an existing corridor, WSDOT typically uses managed access for reasons of time and cost, with relies on the local jurisdiction to make sure that any driveway approaches will work from safety and operations standpoint.

WSDOT designates five levels of control for managed access to state highways, with Class 1 being the most restrictive to support a priority function of mobility, and Class 5 being least restrictive to reflect that access needs may have priority over mobility needs. In the study area, SR 162 is designated Class 3, indicating a function that balances mobility and access needs in areas with less than maximum build-out. The prescribed minimum access spacing is 330 feet and access is limited to 1 access point to contiguous parcels under the same ownership.

### Pierce County Access Regulations

Pierce County access guidelines classify two types of access approaches to a roadway, roadway intersections and driveways. Design criteria that could relate specifically to a Rhodes Lake Road Corridor include requirements for access location distance away from sharp curves and prohibiting accesses that create an intersection having more than four legs. If feasible access exists to a property from two or more roads, the County Engineer may refuse access to the higher classified road, and similarly, if feasible access exists to a property from both public road and private easement, access to the public road may be refused. The County Engineer has the discretion, based on projected traffic volumes and channelization and signalization on the existing roadway, traffic and turning movements and other applicable traffic design criteria to restrict number and location of accesses to a County roadway.

Generally driveway approach design is broken into three classifications:

- Residential driveway approach – used to serve up to two single family residences or one duplex unit. Residential driveway approaches must be at least 35 feet from an arterial or local road feeder intersection; 25 feet from a local road minor or cul-de-sac intersection.

- Minor driveway approach – used for single driveway approach with serves a shared access facility. A minor driveway approach is used for multi-family and commercial uses with an approach traffic volume of up to 1,500 vehicle trips per day or up to 150 vehicle trips per peak hour. Minor driveway approaches must be a minimum of 125 feet from an intersection.

- Major driveway approach – used to serve multi-family and commercial uses with an approach traffic volume of 1,500 or more vehicle trips per day or 150 or more vehicle trips per peak hour. Major driveway approaches must be a minimum of 125 feet from an intersection. If multiple major driveway approaches to one parcel are permitted, they must be at least 125 feet apart.

The design and spacing details outlined above reflect the County Guidelines statement that the County Engineer should maximize the distances between driveways along the roadway in order to minimize the number of potential conflicts between vehicles entering and exiting the roadway and those traveling along the roadway.

## PRESERVATION OF RURAL ZONING

While the establishment of a new roadway corridor might raise concerns regarding potential for additional traffic to attract higher density development, without a change to designated zoning in the project area such development would not be allowed to occur. Zoning changes are a political decision; the study area is not currently zoned for high density development and the County's Comprehensive Plan does not identify land use changes that would increase development density in the years ahead. For these reasons, analysis included in the EIS is based on the assumption that current zoning plans will be upheld.

## VISUAL IMPACTS

### Territorial Views

Construction of a Rhodes Lake Road Corridor will change views from the valley floor, as no roadway currently exists in these locations. Prominent visual features in the study area include the ridges above the Orting and Puyallup Valleys, the Carbon and Puyallup Rivers, and Mount Rainier. Views along the ridges have changed substantially in recent years, from primarily forested hillsides to largely developed residential areas. Views along that valley floor that once consisted of primarily agricultural vistas between Sumner and Orting now include numerous housing developments.

## Hillclimb/Earthwork

The preferred alternative recommended by the Draft EIS would climb a steep and currently forested hillside to reach the Orting Plateau. Original estimates based on an urban roadway section projected that 38.8 acres of vegetation would be disturbed. If a wider roadway section were selected for the Roads Lake Road Corridor, a wider footprint would be required, which would require more than 38.8 acres of vegetation clearing.

To minimize risks of slope failures associated with construction on steep slopes, the roadway must be engineered with properly angled cut and fill slopes and other design features that could include retaining walls.

There is no question that the removal trees on the hillside, coupled with the earthwork required to minimize erosion and slide hazards, will bring visible change to valley views. For reference purposes, it would be reasonable to compare the anticipated appearance of a Rhodes Lake Road Corridor to that of the recently completed Lake Tapps Parkway, pictured below.

## Measures to Minimize Visual Impacts

In addition to design that is sensitive to the rural character of the study area, efforts to minimize visual impacts would involve employment of Best Management Practices (BMPs) during construction. BMPs could include restricting activities that require moving soil to drier seasons to reduce potential for erosion or slides, and taking care with regard to disturbance of natural conditions by limiting the amount of area that can be cleared. Retaining walls could be used in selected locations to minimize cut and fill slopes. Where walls would be clearly visible, design materials consisting of natural-looking treatments such as concrete form liner or gabion/stone walls could improve the visual quality of the roadway and help to blend with the forest and adjacent natural materials.

It is important to remember that a portion of the initial visual impacts would be temporary. Permanent clearing could be kept to the minimum required for operation of the roadway. Replanting of native trees and shrubs to offset initial vegetation losses would be planned as a step toward restoration of natural conditions. Highway 99 near Nisqually, shown in the photo below, illustrates an example of revegetation strategies to reestablish tree and shrub cover as close to the roadway as is consistent with safety and site characteristics.